



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,405	11/10/2003	William M. Hiatt	2269-5558B US (99-0253.01)	4408
63162 7590 06/29/2007 TRASK BRITT, P.C./ MICRON TECHNOLOGY P.O. BOX 2550 SALT LAKE CITY, UT 84110			EXAMINER HECKERT, JASON MARK	
			ART UNIT 1746	PAPER NUMBER
			MAIL DATE 06/29/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/705,405	Applicant(s) HIATT ET AL.	
	Examiner Jason Heckert	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-57 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/29/07 has been entered.

Response to Arguments

1. Due to the applicant's amendments to the claims, the previous rejections are rendered moot. The claims now contain limitations specifying structure pertaining to consolidating material. Sumnitch, Madsen, and Taniyama do not teach this feature. However, these references are still relevant because of their teachings of substrate cleaning methods.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1-2, 4-5, 12, 16-19, 26, 27, 31-40, 45 rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (Ito). Ito discloses an apparatus for treating substrates. After substrate preparation, a development process, such as a photolithographic step

(paragraph 5), is carried out before an appropriate cleaning/drying step. The development process reads on material consolidation. Also disclosed is a rotatable support 12 that both holds and agitates the substrate with spinning. Wall 105 receives fluid removed during the cleaning process. This wall is external to the rotary support and fabrication site. Rinsing liquid supply port 20, readable on applicator or nozzle, delivers cleaning fluid to the substrate. Figure 16 depicts a negative pressure condition created by structure 103 in order to remove material. The device also has multiple gas nozzles to blow nitrogen gas. Also disclosed is a transportation robot (paragraph 52). In regards to claim 35, a fluid source is inherent.

Claim Rejections - 35 USC § 103

4. Claims 3, 6-8, 11, 13-15, 43-44, 49-51, 54, 57 rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Sumnitch. Ito does not disclose the limitations of these claims. However, these are all known structures in the art of substrate processing and cleaning. Sumnitsch discloses a substrate processing apparatus consisting of a fabrication or etching site with a material removal component (Fig. 3). The material removal component comprises a support 1 located within the fabrication site that can be raised or lowered. Said support is capable of rotating to facilitate the removal of waste from the surface of the substrate. Sumnitsch clearly shows in Figure 3 that the apparatus is designed so that receptacles 25, 26, and 27 by means of orifices 28, 29, and 30 capture the waste so that it does not fall back into the fabrication site. Said receptacles are in communication with reservoirs 46 and 47 via conduits 39-41 whereby waste material and cleaning or etching agents are returned to said reservoirs.

Sumnitch discloses that pumps can be included to facilitate the movement of fluids (col. 5 lines 36-37).

5. Sumnitsch also teaches that cleaning agents and rinsing water can be applied to the surface of a substrate via joint aperture 42. As stated previously, Sumnitsch discloses multiple receptacles stacked on top of one another. The fabrication site and support are showed as being enclosed in tank 20 in Figure 3, and the applicator 42 is external to the tank. This tank serves as a protective cover in between the support and unconsolidated material. The receptacles are located on the periphery of the substrate support, and the material removal components, such as the conduits and reservoirs, are located outside of the tank.

6. As stated previously, the support element 1 is capable of rotating both during and after application of a cleaning agent. This rotation constitutes agitation. The different receptacles 25-27 that surround the periphery are in line with different cleaning zones, wherein when the support is in line with a receptacle, aperture 42 applies a certain agent from reservoirs 46, 46, or water line 43. Said aperture can be adjusted to obtain the desired distance from the support structure (col. 5 line 15-16).

7. In regards to claims 49-51, 57 the device disclosed by Sumnitsch, as stated previously, is capable of discharging a material to the surface of a substrate, removing the excess waste, and returning it to a reservoir. This is structurally equivalent to the device of claim 49. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44

USPQ2d 1429. 1431-32 (Fed. Cir. 1997). As stated previously, Sumnitsch discloses conduit lines for transporting the material to the reservoirs as well as the possible inclusion of pumps to facilitate fluid transfer. It would have been obvious at the time of the invention to modify Ito and include a reclamation system, as disclosed by Sumnitch, to allow for the recycle of used fluids as is known in the art.

8. Claims 20-25, 28-30, 46-48 rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Madsen. Ito does not disclose the limitations of these claims, however they are known and common in the art. Madsen discloses a fabrication and cleaning chamber 12 and a material removal component downstream of the fabrication chamber contain a plurality of material removal heads 14 that are oriented toward the surface of the substrates processed. Madsen further discloses that some of the heads 14 are capable of sucking the material to be removed. Such suction, by definition, implies the use of a negative pressure source suitable for the removal of a substantial amount of waste. A material reclamation system comprised of tub 15, pump 16, and water tank 17 is in communication with the heads 14 (col. 2 line 58-60). The material is then returned from the heads to the water tank by means of the pump via the tub. This tub serves the same function as a reservoir, and connectively these structures provide the function of a conduit. Madsen discloses that the removed material can pass through a filter (col. 3 line 19), which separates the waste material from the originally supplied material.

9. As state previously, Madsen discloses a plurality of material removal heads 14. Some of these heads discharge a sharp jet of pressurized air (col. 2 line 43) and are

Art Unit: 1746

referred to as air-knives (col. 2 line 41). These heads are used to remove waste from the surface of the substrates processed. Said heads have positioning elements so that they may be located at a suitable level (col. 2 line 37-38). In addition to a head-adjusting element, Madsen also teaches a conveyor 11 for transporting the substrate from the fabrication and cleaning chamber to the material reclamation chamber.

10. In the cleaning chamber 12, a wash element 13 is included to apply a cleaning agent to the surface of the substrate for the removal of unconsolidated material. As stated previously, a water tank holds the wash water, which is the primary cleaning agent.

11. In regards to claim 46-47 the chamber 12 comprises a cleaning zone, the tank 17 is a source for a cleaning agent, and wash element 13 contains nozzles for application of material located above the substrate. Furthermore, there is a plurality of said nozzles, and they emit a fluid that is, by nature, under pressure. In regards to 48, Madsen does not distinctly state that the cleaning zone is laterally adjacent to the fabrication site. However, he does state that conveyor 11 receives substrates that have been fabricated and are ready to be treated or cleaned (col. 2 lines 9-19). Furthermore, Madsen's device depicts two laterally adjacent cleaning zones, one for application of material, and one for the removal of said material. It would have been obvious to one skilled in the art, to utilize the device disclosed by Madsen adjacent to the fabrication site with conveyor 11 connecting the two, as he implies. It would have been obvious at the time of the invention to modify Ito and include the material removal and reclamation

features of Madsen, in order to allow for the recycle of used materials as is known in the art.

12. Claims 41-42 rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Taniyama. Ito does not discuss process control means or a fixed applicator. Taniyama discloses a fabrication site with a cleaning component. The cleaning component includes a process unit 7a for cleaning, agent supplies 62, 64, 66, 68, and a nozzle 43 for application of cleaning agents. The nozzle is attached to a nozzle assembly 31, which is part of process fluid supply mechanism 30. The nozzle assembly is moved about a vertical shaft 50 by means of a drive mechanism 51. This allows the nozzle to move, and the drive mechanism controls the movement. Also included are flow rate control valves (col.8 line 3) to manipulate the flow of the agents thereby controlling operation of the applicator. Taniyama discloses that the nozzle can also be in a fixed location (col. 9 line 54). It would have been obvious at the time of the invention to modify Ito and include process control elements, as taught by Taniyama, in order to control fluid flow rates.

13. Claims 9-10, 52-53, 55-56 rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Sumnitch and further in view of Madsen. As stated above, Ito in combination with Sumnitsch reads on all of the aspects of claim 1 through claim 8 and claim 49. However, neither discloses the inclusion of a filter. Madsen, as stated above, does disclose the use of a filter in a substrate treating apparatus to separate the waste fluid into waste and a recyclable fluid. Furthermore, filters are commonly used throughout to perform material separation. It would have been obvious

Art Unit: 1746

to one skilled in the art to modify Ito in view of Sumnitsch and further include a filter to separate the waste fluid into its constituents as taught by Madsen.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Heckert whose telephone number is (571) 272-2702. The examiner can normally be reached on Mon. to Friday, 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMH

A handwritten signature in black ink, appearing to read 'Michael Barr', with a large, sweeping underline that extends to the right.

**MICHAEL BARR
SUPERVISORY PATENT EXAMINER**